

## Susan C. Paulsen, Ph.D., P.E.

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### Professional Profile

Dr. Paulsen has 24 years of experience with projects involving hydrodynamics, aquatic chemistry, and the environmental fate of a range of constituents. She has provided expert testimony on matters involving the Clean Water Act and state water quality regulations, and she also provides scientific and strategic consultation on matters involving Superfund (CERCLA) and Natural Resources Damages (NRD). She has expertise designing and implementing field and modeling studies of dilution and analyzing the fate and transport of organic and inorganic pollutants, including DDT, PCBs, PAHs, copper, lead, and selenium, in surface and groundwater and in sediments.

Dr. Paulsen has designed and implemented field studies in reservoir, river, estuarine, and ocean environments using dye and elemental tracers to evaluate the impact of pollutant releases and treated wastewater, thermal, and agricultural discharges on receiving waters and drinking-water intakes. Dr. Paulsen has designed and managed modeling studies to evaluate transport and mixing, including the siting and design of diffusers, and has evaluated water quality impacts of stormwater runoff, irrigation, wastewater and industrial process water treatment facilities, and desalination brines. Dr. Paulsen has extensive knowledge of California water supply issues, including expertise in California's Bay-Delta estuary, the development of alternative water supplies, and integration of groundwater basins into supply and storage projects.

Dr. Paulsen has designed studies using one-dimensional hydrodynamic models (including DSM2 and DYRESM), three-dimensional CFD modeling, longitudinal dispersion modeling, and Monte Carlo analysis. Dr. Paulsen has participated in multi-disciplinary studies of the fate and transport of organic and inorganic pollutants, including DDT, PCBs, PAHs, copper, lead, selenium, and indicator bacteria in surface waters, groundwaters, and/or sediments. She has worked on matters involving both CERCLA and NRDA, including several involving the fate and transport of legacy pollutants, and she has evaluated the impacts of oil-field operations on drinking-water aquifers.

Dr. Paulsen has broad expertise with water quality regulation through the Clean Water Act and state regulations in California, Washington, Hawaii, and other states, and has worked on temperature compliance models, NPDES permitting, permit compliance and appeals, third-party citizens' suits, and TMDL development. She has evaluated the importance of background and natural sources on stormwater and receiving-water quality and the development of numeric limits for storm flows and process-water discharges. Dr. Paulsen is the author of multiple reports describing the history and development of water quality regulations and has provided testimony on regulatory issues, water quality, and water rights.

## Academic Credentials & Professional Honors

Ph.D., Environmental Engineering Science, California Institute of Technology (Caltech), 1997

M.S., Civil Engineering, California Institute of Technology (Caltech), 1993

B.S., Civil Engineering, Stanford University, 1991

## Licenses and Certifications

Licensed Professional Civil Engineer, California, #66554

## Prior Experience

Various positions including President, Flow Science Incorporated, Pasadena, California, 1997-2014

Consultant to Flow Science Incorporated, Pasadena, California, 1994-1997

Staff Engineer, Dames & Moore, Civil Design Group, San Francisco, California, 1990-1992

Graduate Research and Teaching Assistant, Hydrologic Transport Processes and Fluid Mechanics, California Institute of Technology, Pasadena, California, 1993-1997

Research Engineer, Fraunhofer Institute for Atmospheric Environmental Research, Garmisch-Partenkirchen, Germany (West), 1989

Instructor, Technical Communications Program (joint Business School/School of Engineering program), Stanford University, Stanford, CA, 1989-1990

## Professional Affiliations

American Society of Civil Engineers — ASCE

National Ground Water Association

## Languages

Italian

German

## Publications

Mead AM, Paulsen SC, Seyfried R. Dealing with drought: Modeling the effects of California's recent drought on a POTW discharge to the Sacramento River. Proceedings of the Water Environment Federation, WEFTEC 2016, New Orleans, pp. 3490-3513, September 2016.

Paulsen SC, Mesard PM. Opportunity under our feet: Successfully managing groundwater basins to balance stakeholder interests. American Bar Association, 44th Spring Conference on Environmental Law, San Francisco, CA, 2015.

Mead AM, Paulsen SC, Seyfried R. Dealing with drought: Modeling the effects of California's recent drought on a POTW discharge to the Sacramento River. Proceedings of the Water Environment Federation, WEFTEC 2016, New Orleans, pp. 3490-3513, September 2016.

Byard JL, Paulsen SC, Tjeerdema RS, Chiavelli D. DDT, Chlordane, Toxaphene and PCB Residues in Newport Bay and Watershed: Assessment of Hazard to Wildlife and Human Health. Reviews of Environmental Contamination and Toxicology 2015; 235.

California Council for Environmental and Economic Balance (CCEEB); authored by Paulsen SC. A Clear Path to Cleaner Water: Implementing the vision of the State Water Board for improving performance and outcomes at the State Water Boards. CCEEB: San Francisco, CA. 2013. Available at [www.cceeb.org](http://www.cceeb.org).

Love N, Canton C, Skigen S, Yoon VK, Paulsen SC, Claff R. Critical analysis of the Test of Significant Toxicity and the implications for Whole Effluent Toxicity testing. Presented at SETAC National Conference, November 21, 2013.

South Orange Coastal Ocean Desalination (SOCOD) Project; authored by Expert Panel Member Paulsen SC. Expert Panel Report: Offshore Hydrogeology/Water Quality Investigation Scoping, Utilization of Slant Beach Intake Wells for Feedwater Supply. Municipal Water District of Orange County (MWDOC): Fountain Valley, CA. 2012. Available at [http://www.mwdoc.com/filesgallery/FINAL\\_Expert\\_Panel\\_Rept\\_10\\_9\\_2012.pdf](http://www.mwdoc.com/filesgallery/FINAL_Expert_Panel_Rept_10_9_2012.pdf).

Paulsen SC, Goteti G, Kelly BK, Yoon VK. Automated flow-weighted composite sampling of stormwater runoff in Ventura County, CA. Proceedings, Water Environment Federation 2011.12 (2011): 4186-4203. Also published as automated flow-weighted composite sampling of stormwater runoff. Water Environment Laboratory Solutions 2012; 19(2):1-6.

Paulsen SC, List EJ, Kavanagh KB, Mead AM, Seyfried R, Nebozuk S. Dynamic modeling and field verification studies to determine water quality and effluent limits downstream of a POTW discharge to the Sacramento River, California. Proceedings, Water Environment Federation 2007; 12:5695-5721.

Paulsen SC, List EJ. Potential background constituent levels in storm water at Boeing's Santa Susana Field Laboratory. Report to Expert Panel convened by The Boeing Company and Regional Water Quality Control Board, Los Angeles Region, 2007. Available at [http://www.boeing.com/assets/pdf/aboutus/environment/santa\\_susana/water\\_quality/tech\\_reports/2007\\_background/2007\\_background\\_report.pdf](http://www.boeing.com/assets/pdf/aboutus/environment/santa_susana/water_quality/tech_reports/2007_background/2007_background_report.pdf).

Paulsen SC, List EJ, Santschi PH. Modeling variability in 210Pb and sediment fluxes near the Whites Point Outfalls, Palos Verdes Shelf, California. Environmental Science & Technology 1999; 33:3077-3085.

Paulsen SC, List EJ, Santschi PH. Comment on "In situ measurements of chlorinated hydrocarbons off the Palos Verdes Peninsula, California." Environmental Science & Technology 1999; 33:3927-3928.

Paulsen SC, List EJ. A study of transport and mixing in natural waters using ICP-MS: Water-particle interactions. Water, Air, and Soil Pollution 1997; 99:149-156.

Paulsen SC, List EJ. Tracing discharges in ocean environments using a rare earth tracer. Presented at the 27th IAHR Congress, San Francisco, CA, August 1997.

## Deposition & Trial Testimony

*Glen Harmer v. Steven M. Thomas et al.*, Case No. 4:16-cv-04233-JSW, in the United States District Court, Northern District of California. July 18, 2017.

*Robert Bruncati and Maureen Bruncati v. Billy Wayne Andrews, Jr., et al.*, Case No. CIVDS1309044, in the Superior Court of the State of California, County of San Bernardino, San Bernardino District. August 24, 2015, and September 8, 2015. *City of Cerritos, et al., v. Water Replenishment District of Southern California*, Case No. BS128136, in the Superior Court of the State of California, County of Los Angeles. November 24, 2014.

*The Boeing Company et al. v. State of Washington, Department of Ecology*, Appeal of the 2010 Industrial Stormwater General Permit, Pollution Control Hearings Board, State of Washington. Case No. 09-140. 2011.

*Puget Soundkeeper Alliance v. BNSF Railway Co.*, Case No. C09-1087-JCC, in the United States District Court, Western District of Washington at Seattle. 2011.

## Trials and Hearings

*Hearing Proceedings Regarding Petition Filed by the Department of Water Resources and U.S. Bureau of Reclamation Requesting Changes in Water Rights for the California WaterFix Project, California State Water Resources Control Board. December 14, 2016; May 23, 2017; and June 22, 2017.*

*Robert Bruncati and Maureen Bruncati v. Billy Wayne Andrews, Jr., et al.*, Case No. CIVDS1309044, in the Superior Court of the State of California, County of San Bernardino, San Bernardino District. 2015.

*The Boeing Company et al. v. State of Washington, Department of Ecology*, Appeal of the 2010 Industrial Stormwater General Permit, Pollution Control Hearings Board, State of Washington. Case No. 09-140. 2011.